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(12) UK Patent Application (19) GB (11) 2 293 699 (13) A

(43) Date of A Publication 03.04.1996

(21) Application No 9419581.5

(22) Date of Filing 29.09.1994

(71) Applicant(s)
A C Egerton Limited

(Incorporated in the United Kingdom)

Murray Road, Leesons Hill, ORPINGTON, Kent,
BR5 3QU, United Kingdom

(72) Inventor(s)
Derec Shealds

(74) Agent and/or Address for Service
Fry Heath & Spence
The Old College, 53 High Street, HORLEY, Surrey,
RH6 7BN, United Kingdom

(51) INT CL⁶
H01R 4/24

(52) UK CL (Edition O)
H2E EPAE EPGP E600
U1S S2214

(56) Documents Cited
GB 1076145 A EP 0470887 A1 US 5199899 A
US 5009512 A US 4778405 A US 4296989 A

(58) Field of Search
UK CL (Edition N) H2E EPAE EPGP
INT CL⁶ H01R

(54) Reusable idc interconnector

(57) A body (figure 2) for attaching to an IDC connector (figure 1) includes a wire-receiving flap 52 hinged at 54. The flap has a latch 56 which may engage latch 60 or latch 62 of the body. When latch 56 is engaged with latch 62, a wire within the flap 52 engages an IDC terminal 38 located within opening 70 in the body. The IDC connector may comprise a further IDC terminal connected to the first. An array of terminals may be located side-by-side in one unit (figure 4, not shown).

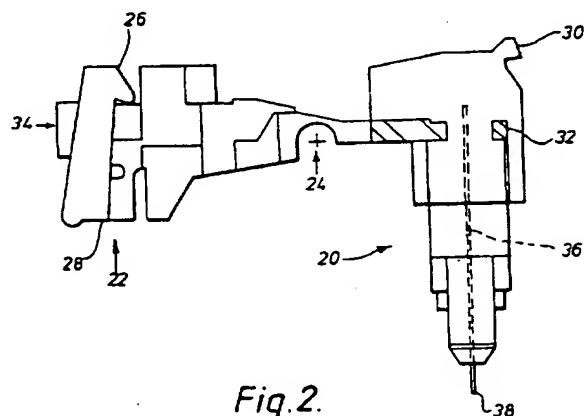


Fig.2.

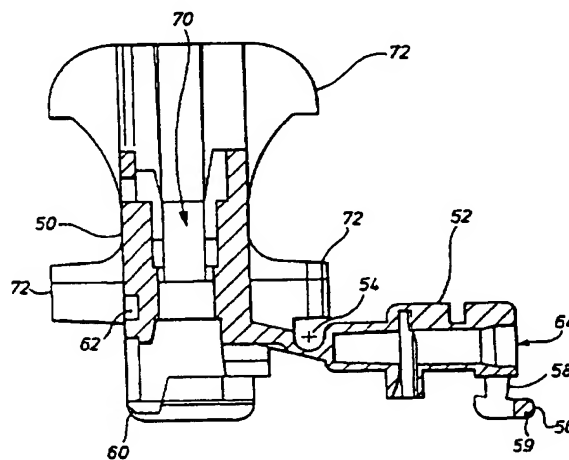


Fig.3.

At least one drawing originally filed was informal and the print reproduced here is taken from a later filed formal copy.

The claims were filed later than the filing date within the period prescribed by Rule 25(1) of the Patents Rules 1995

GB 2 293 699 A

1/4

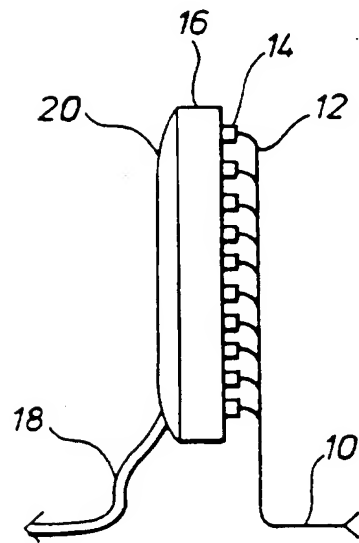


Fig. 1.

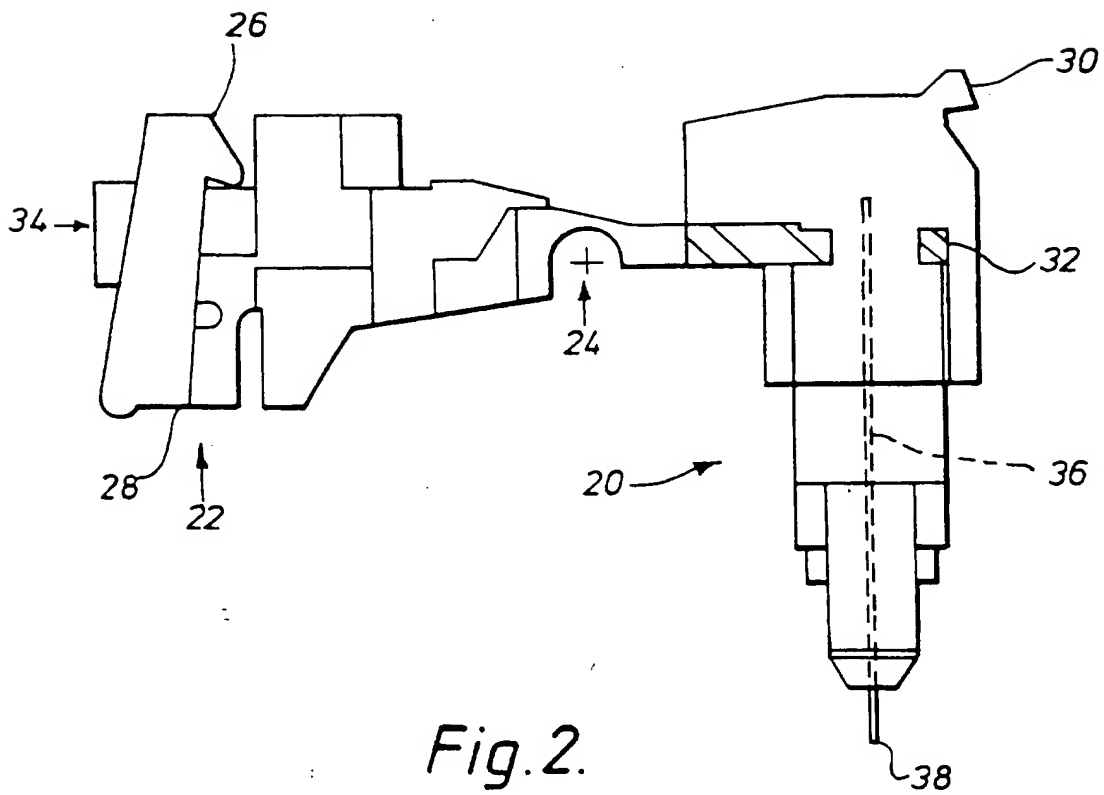


Fig. 2.

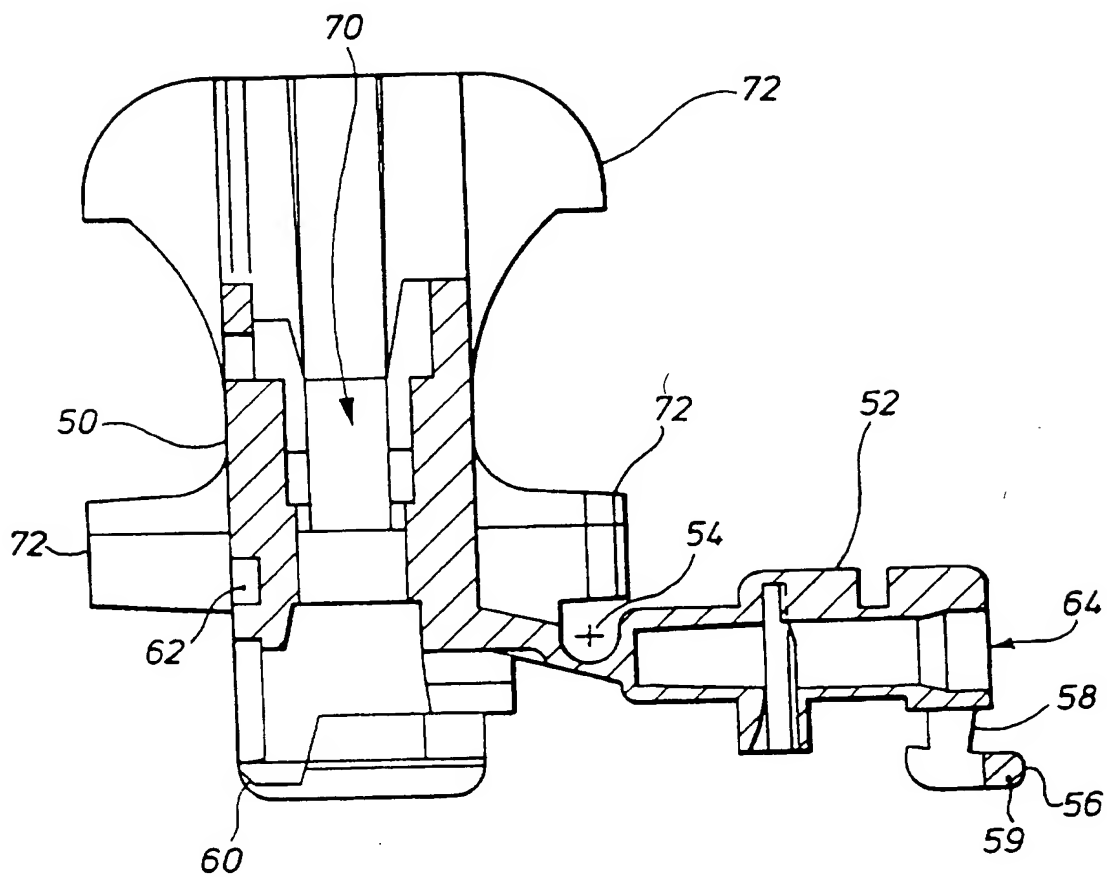


Fig. 3.

3/4

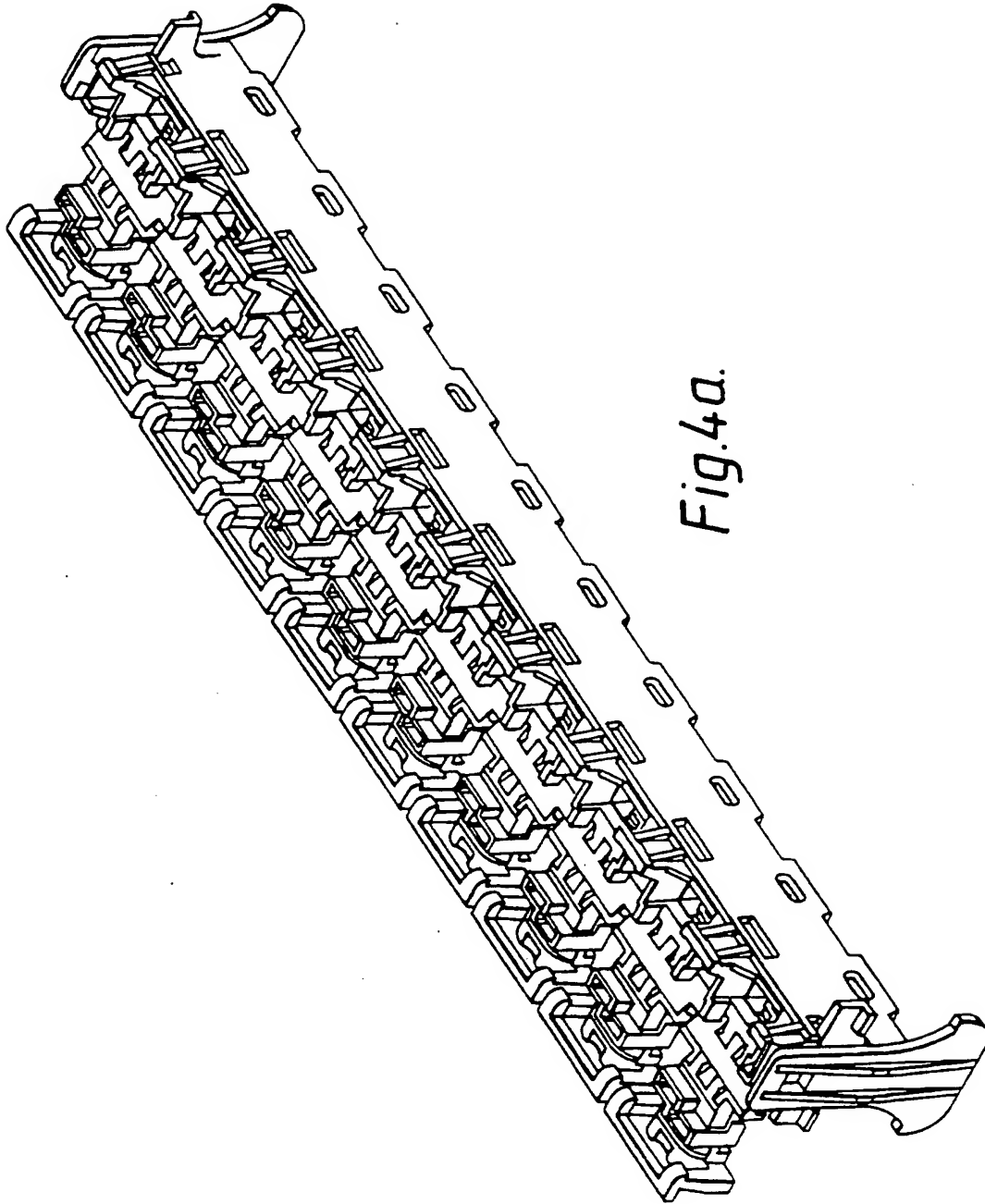


Fig.4a.

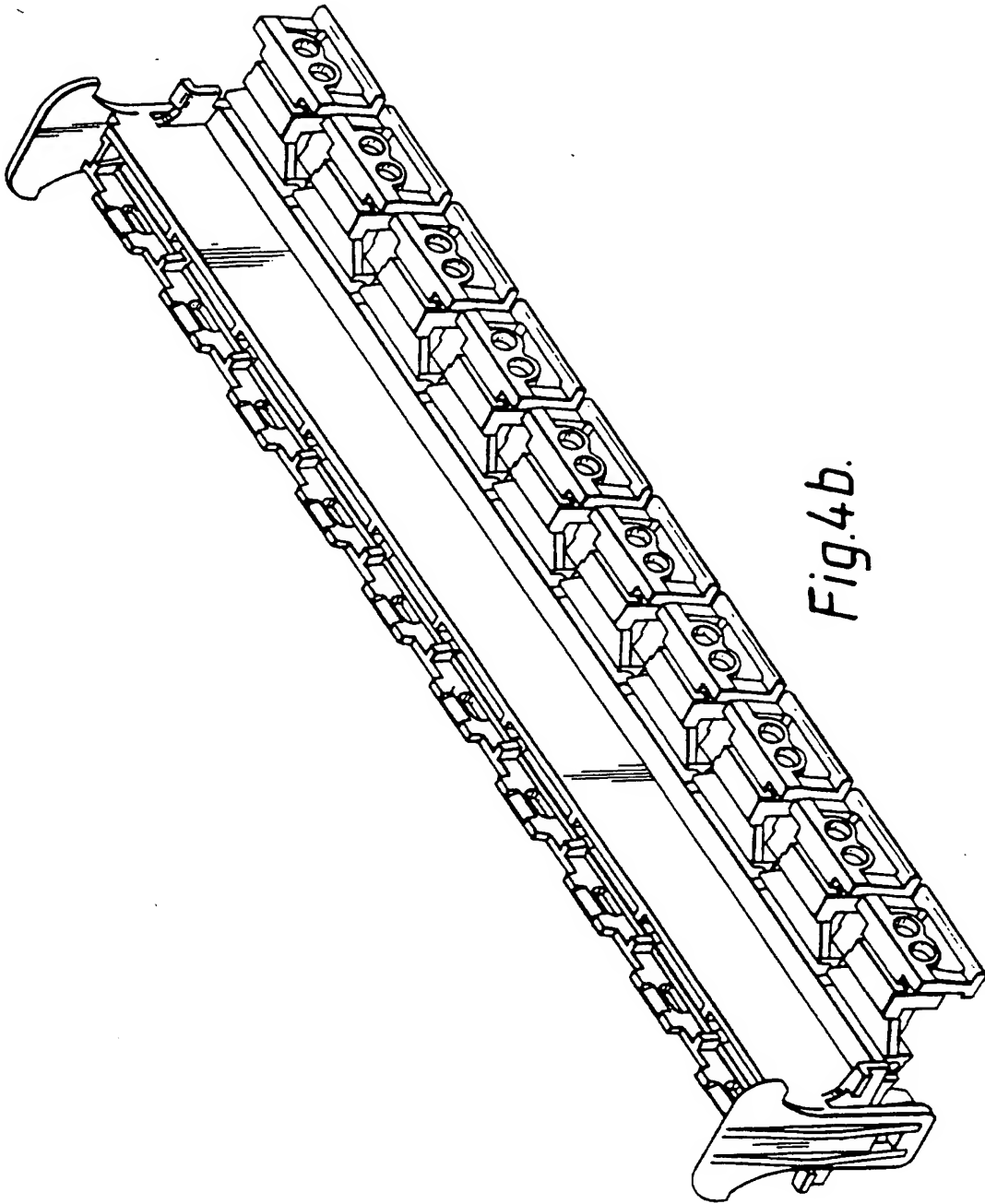


Fig. 4b.

ELECTRICAL CONNECTORS

The present invention relates to electrical connectors, in particular electrical connectors for use in telecommunication systems.

In a junction box of a telecommunication system, incoming wires from an exchange must be linked to outgoing wires to a consumer. Notwithstanding the erection of further dwellings, the configuration of consumer wires is generally constant, whilst replacement and updating etc of exchanges together with changes in allocation of wires to consumers means that it is envisaged that the pattern of connections between exchange and consumer wires will change. In view of the former reason, the exchange wires are viewed as being more likely to need change.

In the above context, the known junction box employs an array of connectors shown very schematically in Figure 1. An exchange cable 10 contains many exchange wires 12, each of which is connected to a releasable connector 14 mounted on a panel 16. Each connector 14 protrudes through the panel 16 and presents an exposed pair of insulation

displacement connector (IDC) terminals at the rear. An engineer connects a consumer wire from a consumer cable 18 to the IDC terminals, and then seals the rear of the panel 16 in a resin encapsulant 20 to provide a weatherproof seal.

Normally, the panel 16, connectors 14, and encapsulated consumer cable 18 will be prepared as a preassembled production unit.

A known form for the connector 14 is shown at Figure 2. It consists of a main body part 20 and a top flapper part 22 hinged to the body part at first hinge line 24. The flapper part 22 has a catch means 26 hinged at a second hinge line 28 which is retained by first or second latch projections 30 and 32. Normally, the flapper is folded over and retained by a first latch 30 on the body 20, but it can be folded further to be retained by a second latch 32. Limited outward movement of the catch 26 about second hinge line 28 is possible and this allows the catch to disengage the second latch 32, but is insufficient to disengage the first latch 30. Thus, the flapper 22 can be moved freely between two latched positions.

The flapper 22 has an opening 34 for receiving an exchange wire pair (not shown). The opening is positioned such that movement of the flapper 22 between its two latched positions respectively raises and lowers an inserted wire relative to the body 20.

Provided within the body 20 is a pair (one only shown) of IDC connectors 36, positioned such that movement of the

flapper 22 to the second latch 32 causes an inserted wire to be engaged by the IDC connector. Movement of the flapper 22 back to the first latch 30 disengages the wire from the IDC connector 36.

The IDC connectors 36 protrude from the base of the body 20, and are provided at that protrusion with a further connection point 38. It is here that a consumer wire is normally connected.

In view of the intended use of these connections a design life of at least 200 connections/disconnections is usual.

The present invention arises from the applicant's appreciation that it would be of value to provide a less dedicated junction box, in which an engineer could (if desired) make the consumer side connections, but without the tools necessary in the prior art, and without having to encapsulate the rear face.

In its first aspect, the present invention therefore provides an electrical connector having a first releasable IDC connector, electrically connected to a second releasable IDC connector, each IDC connector having associated therewith a means for receiving a wire, the receiving means being moveable between a first state in which the wire is held apart from the IDC connector and a second state in which the wire is inserted into the IDC connector;

the receiving means being retainable in either state by a releasable latch means.

Thus, both exchange and consumer cable can be connected in situ, if desired, without needing any tools. At the same time, any connection errors on the consumer side can be made good simply by releasing the IDC connector, correcting the connector and re-engaging the connector.

It has been appreciated by the applicants that the normal high standards of reliability and longevity applied to the connector of Figure 2 is superfluous in the consumer side cable, since the usual maximum number of operations is 2; a first incorrect connection, followed by release, correction, and re-connection. Therefore, this permits a simplification of the design of this connector, at the expense of superfluous life. As a result, in a particularly preferred version of the invention, the design life of the latch means associated with the second connector is less than the design life of the latch means associated with the first connector. For example, the design life for the first connector may be over 200. The design life for the second connector might be under 100.

It is simplest to construct this connector in two parts, corresponding generally to each IDC connector. Therefore, the second aspect of the present invention provides a kit of parts, comprising a first releasable IDC connector housing, and an electrically conducting element having two IDC elements, wherein the two connector housings are at least semi-permanently engageable, in a fashion which encloses the electrically conducting element such

that each IDC element is within a respective IDC connector housing. Preferably, the electrically conductive element is supplied fitted within one IDC connector housing.

The present invention also relates, in its third aspect, to an assembled array, comprising a plurality of connectors according to the first aspect or assembled from the second aspect, the connectors being fixed in their relative position by a support means, and at least one consumer wire, the or each consumer wire being connected to a connector. Such an array is suitable for direct installation in a junction box, and can be assembled more easily and more quickly than known arrays since neither tools nor an encapsulation step are strictly necessary.

An embodiment of the present invention will now be described, by way of example, with reference to the accompanying drawings, in which:

Figure 1 is a schematic depiction from the side of a known connection panel;

Figure 2 is a cross-section through a known IDC connector suitable for use in the connection panel of Figure 1;

Figure 3 is one IDC connector according to the present invention, shown in cross-section; and

Figures 4a and 4b are isometric views, respectively from the underside and top side of an array of IDC connector housings, each being as shown in Figure 3.

The arrangements of Figures 1 and 2 are described above, and no further description is given here.

Figure 3 shows, in cross-section, a second IDC housing, and in accordance with the present embodiment is used in connection with the IDC housing shown in Figure 2, which in that case provides the first IDC connector housing. As shown, the first IDC connector housing is fitted with the IDC element 36, but it is not essential that this be the case it being equally possible to provide the IDC element in the second IDC housing.

The second IDC connector housing consists of a main body part 50 and the flapper part 52 hinged to the body part 50 at a first hinge line 54. The flapper part 52 has a catch means 56 attached to the flapper part via a relatively thin extension 58. The catch means 56 is retained by first or second latch projections 60 and 62. Normally, the flapper is folded over and retained by first latch 60, but it can be folded further to be retained by second latch 62. It is possible to move the catch 56 outward by flexing the extension 58, and this allows the catch to disengage the second latch 62, but is usually insufficient to disengage the first latch 60. Thus, the flapper 52 can be moved between two latched positions. However, the absence of any hinge corresponding to hinge line 28 of Figure 2 means that movement between the two latch positions is less easily accomplished than in the first IDC connector housing.

The flapper 52 has an opening 64 for receiving a consumer wire pair (not shown). The opening is positioned such that movement of the flapper 22 between its two

latched positions respectively raises and lowers an inserted wire relative to the body 50.

The body 50 has an opening 70 adapted to receive the body portion of the first connector housing 20, such that the protruding IDC connector 36, in particular the further connection point 38, is received within the body 50 of the second IDC housing. Latch means (not specifically shown) are provided on the inner surface of the opening 70 on the outer surface of the first IDC connector housing, to ensure (in the illustrated embodiment) a permanent fit. Of course, permanence of fit is not essential, and a semi-permanent (ie releasable) fit is sufficient. When the first IDC connector housing containing IDC connector 36 is fitted within the opening 70, the further connection point 38 extends into the area swept out by motion of the wire on movement of the flapper 52 between its two latched positions. Thus, movement of the flapper 52 between these two positions causes an inserted wire to be respectively connected and disconnected to the further connection point 38.

A side handle 72 is provided on one edge of the second IDC connector housing 50, to connect the housing to a side of a panel or other supporting means.

Figures 4a and 4b shown an array of second IDC connector housings, the array comprising ten individual housings, formed as a single unit and having side handles at each end of the array.

It will be appreciated that the above specific

description relates to an exemplified embodiment of the present invention, and is not to be construed as limitative of the invention. Equally, it will be apparent to the skilled person that modifications to the above can be made, without departing from the scope of the present invention.

It is envisaged that embodiments of the present invention could be supplied as fully assembled units, incorporating linked first and second IDC connector housings enclosing an IDC connector, or as separate IDC connector housings, one (preferably the first) housing an IDC connector.

CLAIMS

1. An electrical connector having a first releasable IDC connector, electrically connected to a second releasable IDC connector, each IDC connector having associated therewith a means for receiving a wire, the receiving means being moveable between a first state in which the wire is held apart from the IDC connector and a second state in which the wire is inserted into the IDC connector;
the receiving means being retainable in either state by a releasable latch means.
2. An electrical connector according to claim 1 wherein the receiving means of the respective first and second IDC connectors are non-identical.
3. An electrical connector according to claim 2 wherein the design life of one receiving means is at least twice the design life of the second.
4. A kit of parts comprising a first releasable IDC connector housing, and an electrically conducting element having two IDC elements, and a second releasable IDC connector housing, wherein the two connector housings are at least semi-permanently engageable in a version which encloses the

electrically conducting element such that each IDC aligned is within a respective IDC connector housing.

5. A kit of parts according to claim 4 wherein the electrically conducting element is held within one of the connector housings.
6. An array of connectors according to any one of claims 1 to 3 or assembled from the kit of claim 4 or claim 5, the connectors being fixed in their relative position by a support means, and at least one consumer wire, the or each consumer wire being connected to one IDC connector of at least one of the connectors.
7. A connector substantially as described herein with reference to the accompany drawings.



The Patent Office

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Application No: GB 9419581.5
Claims searched: 1, 2, 3, 6, 7

Examiner: F J Fee
Date of search: 12 May 1995

Patents Act 1977 Search Report under Section 17

Databases searched:

UK Patent Office collections, including GB, EP, WO & US patent specifications, in:
UK CI (Ed.N): H2E [EPAE, EPGP]
Int CI (Ed.6): H01R
Other:

Documents considered to be relevant:

Category	Identity of document and relevant passage	Relevant to claims
Y	GB 1076145 [3M]	1
Y	EP 0470887 A1 [LABINAL]	1
Y	US 5199899 [ITTAH] releasable idc connector housings 11,12 and idc interconnector 14 (figure 2)	1
Y	US 5009612 [RISHWOOD] latches 60,62 on releasable connector housing 44 (figures 2,6 column 4 line 66 to column 5 line 3, column 6, lines 4 to 14, 32 to 38)	1
Y	US 4778405 [STERKEN]	1,2
Y	US 4296989 [LARSON]	1

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